

radios with a phased array antenna to provide higher channel reuse and higher trunking efficiency.

In the Claims:

Please cancel Claims 1.

Please add new Claims 10 to 19.

10. A base station comprising:

a phased array antenna containing antenna elements distributed in a multi-dimensional spatial array;

a wideband digital radio having an operational bandwidth that contains all communication channels of said base station, coupled to said phased array antenna and being adapted to perform receive channel signal processing in which the digital representation of the entire spectrum for each antenna element is divided into receive channels for a respective waveform of interest, and to perform transmit channel signal processing in which digital representations of individual channels are combined into a single transmission channel.

11. A base station according to claim 10, further including an array processor coupled to said digital radio and being operative to controllably define a narrow beam of said phased array antenna.

12. A base station according to claim 10, further including an array processor coupled to said digital radio and being operative to generate amplitude and phase weighting coefficients for defining transmit and receive directivity patterns for said phased array antenna.

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~~13~~. A base station according to claim ~~10~~¹, wherein respective sets of antenna elements of said phased array antenna are coupled with respective wideband digital radios, each of which has said operational bandwidth.

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~~14~~. A base station according to claim ~~13~~⁴, further including a processor coupled to said wideband digital radios and being operative to controllably define a narrow beam of said phased array antenna.

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~~15~~. A base station according to claim ~~13~~⁴, further including a processor coupled to said wideband digital radios and being operative to generate amplitude and phase weighting coefficients for defining transmit and receive directivity patterns for said phased array antenna.

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~~16~~. A method of increasing the capacity of a base station for a cellular communication system comprising the steps of:

(a) providing a phased array antenna containing antenna elements distributed in a multi-dimensional spatial array;

(b) coupling respective sets of antenna elements of said phased array antenna with a wideband digital radio having an operational bandwidth that contains all communication channels of said base station; and

(c) causing said wideband digital radio to perform receive channel signal processing in which the digital representation of the entire spectrum for each antenna element is divided into receive channels for a respective waveform of interest, and to perform transmit channel signal processing in which digital representations of individual channels are combined into a single transmission channel.

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⁸₁₇. A method according to claim ⁷₁₆, wherein step (b) comprises coupling respective sets of said antenna elements with respective wideband radios, each of which has said operational bandwidth.

⁹₁₈. A method according to claim ⁸₁₇, wherein step (b) further comprises controllably defining a narrow beam of said phased array antenna.

¹⁰₁₉. A method according to claim ⁹₁₈, wherein step (b) further comprises generating amplitude and phase weighting coefficients for defining transmit and receive directivity patterns for said phased array antenna.